Charles Batchelor Notebook, Cat. 1307

This notebook covers the period June 1874-February 1878. All of the entries are by Charles Batchelor. The notes and drawings relate to telegraphy, the telephone, the electric pen, the electromotograph, the typewriter, and various mechanical devices. Some of the entries pertain to Edison's inventions, but many also concern Batchelor's own ideas. Pages 29-41 and 43-44 contain impressions of plates, which may have been intended to accompany an 1874 manuscript by Edison and Batchelor on telegraphy. This material can also be found in Notebooks, Cat. 297 and Cat. 298 (Thomas A. Edison Papers Microfilm Edition, Part I, reel 3), and it has not been refilmed. The book contains 74 numbered pages and an index. Pages 1-40 were numbered by Batchelor. The remaining pages were numbered by an archivist.

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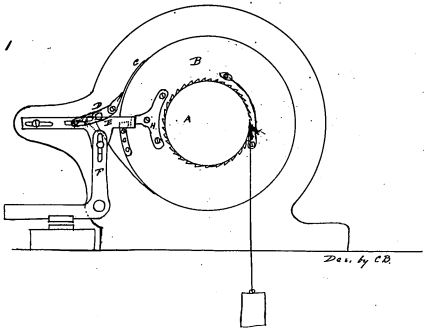
Index.

District 181. 1, 2, 4, 5, 6, 14.

No 1

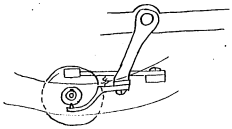


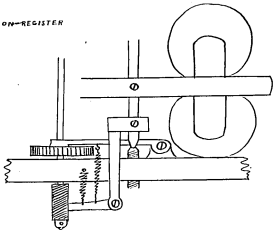
June 16th 1874 EDISON'S DOMESTIC TELEGRAPH RECEIVER.

New Brake stop movement.

No 2.

SELFSTARTER ON A TILLOTSON REGISTER
Aug 1878

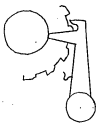




Break wheels & Com

No 3

4



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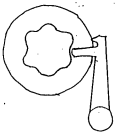

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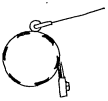

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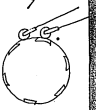

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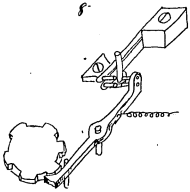

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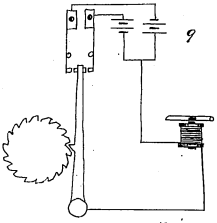
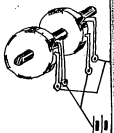


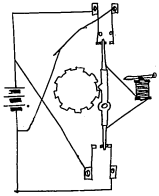
Reverse current 2 batteries

10



Reverse Current

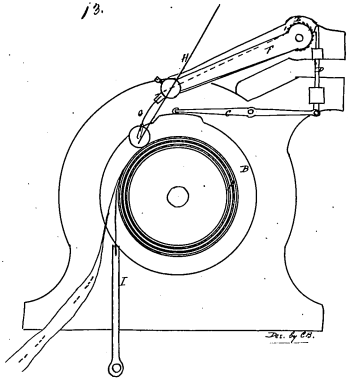
11



Reverse Current 1 Battery

12

13.

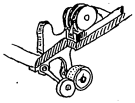


June 16th 1874

EDISON'S DOMESTIC TELEGRAPH RECEIVER.

Pen lifting movement

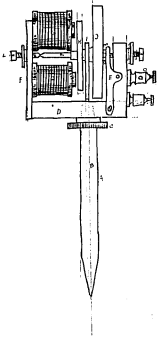
14



Edison's self winder for winding messages off on other receivers.

PEN FOR AUTOGRAPHIC PRESS

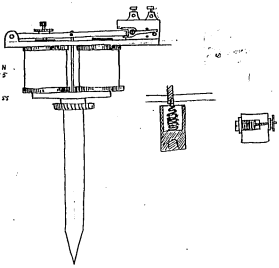
16



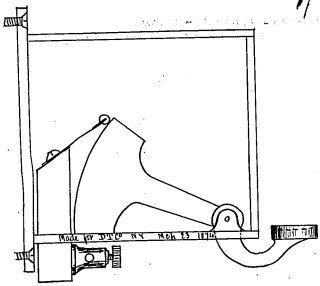
EDISON'S PEN
July 18th 1875
for
AUTOGRAPHIC PRESS.

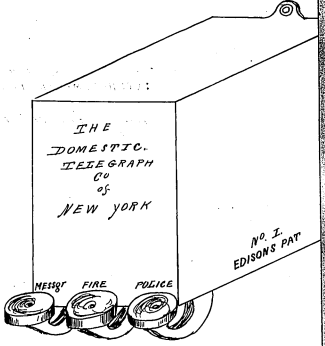
PEN FOR AUTOGRAPHIC PRESS

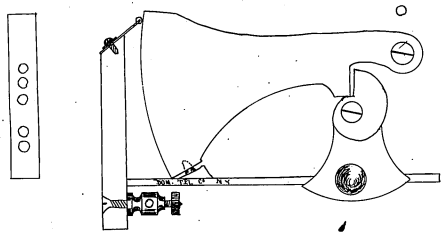
15



1875
Aug 13
BATCHELOR'S PEN
Aug 13 1875
AUTOGRAPHIC PRESS


MODEL BY DIXON N.Y. MAR 15 1910


THE
DOMESTIC
TELEGRAPH
CO
of
NEW YORK
No. I.
EDISON'S PAT
MESSG'R
FIRE
POLICE


MODEL BY DIXON N.Y.

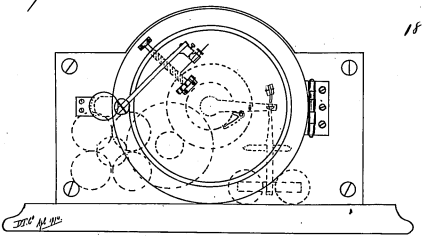
Type Wheel.

: VCBHPADMXRZK ELNTQWUFGJSY = 1987536-42801.

Escape wheel 20 teeth

April 10th 1874. Receiving Set for Domestic Set C
Designed by — CA

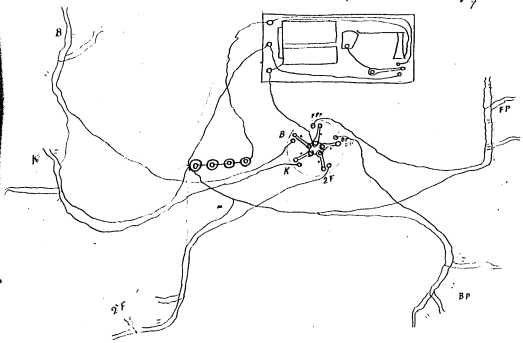
18

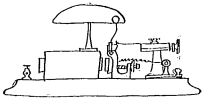


Step cold.

HOLMES BURGLAR ALARM FITTED BY
SEP 10 1875.

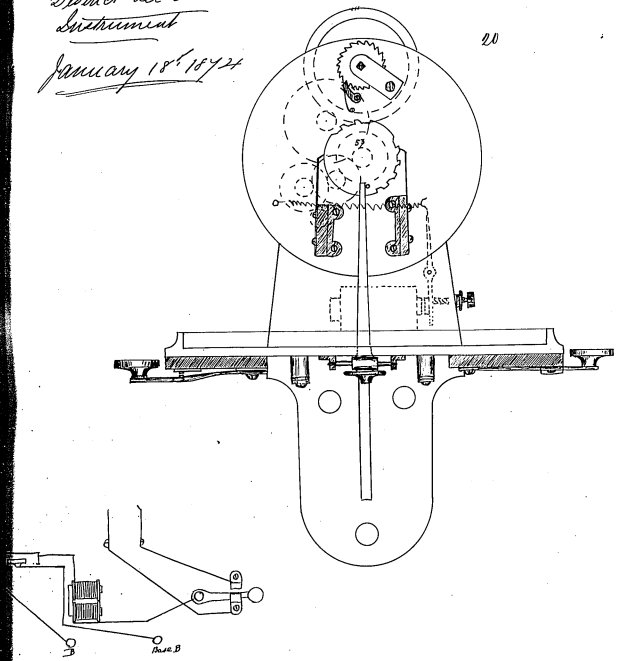
19





District Tel Co's
Instrument

January 18th 1874



Tuning Forks. 21

Formula for calculating a fork to give any required number of vibrations per second

$$V_s = \frac{K e}{(l+y)^2}$$

All measurements in millimetres. To convert inches into millimetres multiply by 25·4 (near enough)

V_s = Vibrations
K = 818240· (Constant of Steel)
e = Thickness of prong
l = length of bottom of curve
y = 4 mm constant for base

Example:— Given fork 6 in long & 3/8 thick to find the vibrations:—

$3/8 = x^{\text{in mm}} = 3/8 \times 25{\cdot}4 = 9{\cdot}525^{\text{mm}}$

$$\begin{array}{r} 818240 \\ 9{\cdot}525 \\ \hline 4091350 \\ 16365400 \\ 40913500 \\ 7264430 \\ \hline \end{array}$$

$$\begin{array}{r} 25{\cdot}4^{\text{mm}} \\ 6^{\text{in}} \\ \hline 152{\cdot}4 \\ 4{\cdot}0 \text{ constant} \\ \hline 156{\cdot}4 \end{array}$$

$$\begin{array}{r} 156 \\ 156 \\ \hline 936 \\ 780 \\ 156 \\ \hline 24336 \end{array}$$

$$24336 \overline{)7794021{\cdot}750} \; 320{\cdot}2 \text{ vibrations}$$

$$\begin{array}{r} 7730008 \\ 49322 \\ 48672 \\ 650{\cdot}7 \\ 48672 \end{array}$$

$$\therefore V_s = \frac{Ke}{(l+y)^2} = V_s = \frac{818240 \times 3/8^{\text{in}}}{(6^{\text{in}} + 4^{\text{mm}})^2} = \frac{818240 \times 9{\cdot}525}{(152{\cdot}4^{\text{mm}} + 4^{\text{mm}})^2} =$$

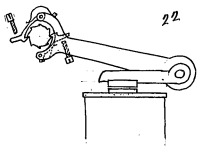
$$= \frac{818240 \times 9{\cdot}525}{(156)^2} = \frac{7794021{\cdot}750}{24336} = \underline{320{\cdot}2 \text{ vibrations per second}}$$

Spice's method.

JULY 11th 1874
Finished

EDISON'S NEW UNIVERSAL PRIVATE LINE PRINTER

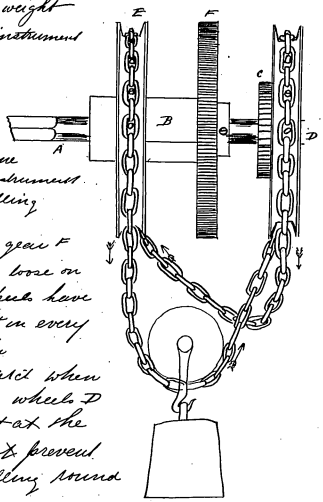
2d.



New Escapement.

A method of winding a weight up without stopping the instrument that it drives

A is a shaft on which the wheel D is firmly fixed & the ratchet C also.
A pawl is fixed on the frame of any suitable part of instrument & prevent the weight pulling round the wheel D
B is the hub of the large gear F & chain wheel E & runs loose on shaft A. The chain wheels have pins in the groove & fit in every other link in the chain
As may be seen from sketch when A is turned to right the wheels D lifts up the weight but at the same time does not prevent the weight from pulling round E.

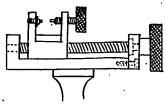


23

Sep. 6. 1874

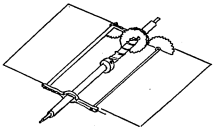
24

Good adjustment for Polarized Relays.



Sep 6 1874

25 Expanding Fan.



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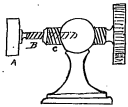
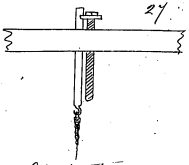


Adjustment for a Relay etc.
A Armature
B left hand screw
C Right Hand screw.

27.

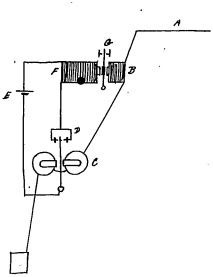


Adjustment

Sep 5th 1874

28

Method of reversing a current through a relay without opening the points.



A is line passing through B + C + ground.
C is polarized magnet which whether the line is charged or not closes the local circuit for magnet F which acts as a spring for armature
A positive current now comes over at A drawing armature G + magnet B. + also lever + C. Reverse it + the polarized magnet working quicker than the ordinary open local + prevents F from pulling armature

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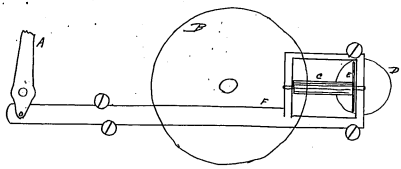
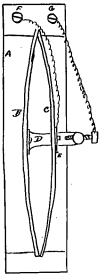
Speed Regulator for clockwork.

29



B is a crown wheel on the end of the 3 or 4 shaft. + pinion in the pinion C on which is disc E Dot E rolls on D disc which is fastened to fan shaft
Whole carriage F is moveable. + when moved to the left so that disc E is nearest the edge of D it allows the pinion C + of course the clock work to move quicker.

30

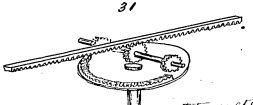


Dec. 6th 1874

Hard Rubber Thermostat.

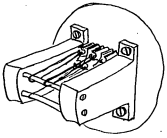
About Nov 8th Edison suggested to me that as Hard Rubber had such great expansive properties we should make a thermostat of it & try it. Made one atc drawing & it worked well.

31



A Reciprocating motion from a rotatory stationary at Cable end
Sept 19 1878 got it from Wythe's Speed Gauge

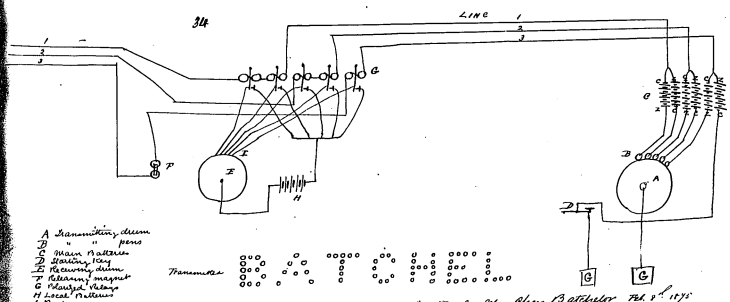
32.



New arrangement for drawing back the bars on F Perforator put on Feb. 5th 1878
I adopted in future

33.

Batchelor's Stock & gold quotation printer
Feb 8th 1875



A Transmitting drum
B " " pens
C Main Batteries
D Starting key
E Receiving drum
F Relaying magnet
G Polarized Relays
H Local Relays
I Rec pens.

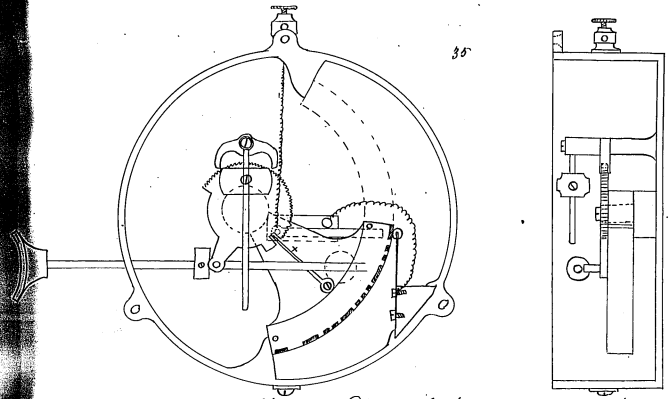
Transmitter

Received BATCHELOR

Invented by Mr Chas Batchelor Feb 8th 1875
7 Dean Street 12th 1875.

Principle
3 Wires.

35

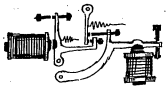


For for Domestic Telegraph Co NY Designed by Chas Batchelor Nov 22nd 1874

It matters not how hard or soft the person pushes in the button the signal will always be sent at the same speed. The receiving instrument is not "set up" in until the arm is on the down stroke so that a message from 343 would be received thus:- — ... ---- ... The first two dots counting as nothing. The escapement + ball prevent the arm from coming down too quick + the spring X prevents the dots from being cut up by the jar of the lever.

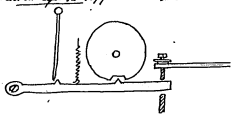
Drawn June 20 1875
NEW STOP FOR DOMESTIC RECORDER
Sulled in Apl 18th 1877
BATCHELLER Batchelor

36



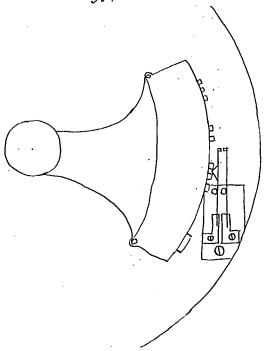
Gerrit Smith's repeater

37.

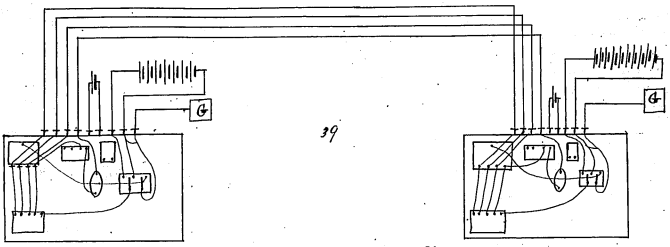


April 20th 1875
Made new box on the principle for Domestic Tel Co & it works first rate better than any other also much cheaper.
C Batchelor
Written May 1st

38.



Roman Letter on 4 wires



Successfully worked between New York + Philadelphia
by T A Edison + C Batchelor Sunday Jan 31st 1875

DUPLEX TO PREVENT ANYONE 40
TAPPING JAY GOULDS WIRE
EDISON JULY 1st 1875

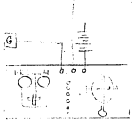


Fig 1

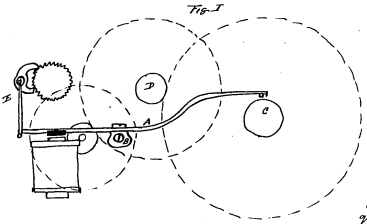


Fig 2

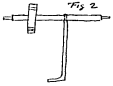
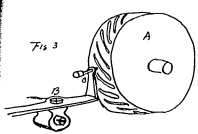


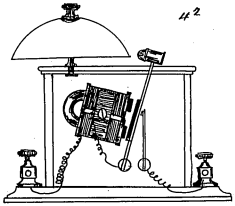
Fig 3

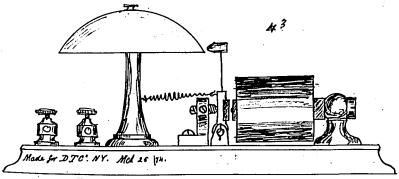


In my Direct Printer, the releasing of the instruments in a circuit being performed by a magnet in each instrument worked by a negative current on the 3rd wire if the 3rd wire should become detached or be 'down' the instrument would run all the paper out in order to prevent this the release lever A is put on a 'shoe' B which moved sideways & pivoted on its axis, when the line is open the lever A falls on to a 'worm' C which can be on the shaft shown or at D where it would stop the inst. quicker as C turns round it moves A sideways till it touches rod E another view of rod E is shown in Fig 2.

Another way of preventing this is shown in Fig 3 a wheel A is fixed on the slow shaft & has spiral grooves in the periphery in which the stopper C can drop when the magnet is open. Thus proven can be cut so that if anything should happen to wire 3 the machine would run out 50 or 100 words length of paper & then stop when the magnet is closed springs back to its normal position. When the instrument is in good order & working the release magnet must be closed every 50 or 100 words as the case may be.

Chas Batchelor


4 2


4 3
Made for D.J.C. N.Y. Mch 26 94.

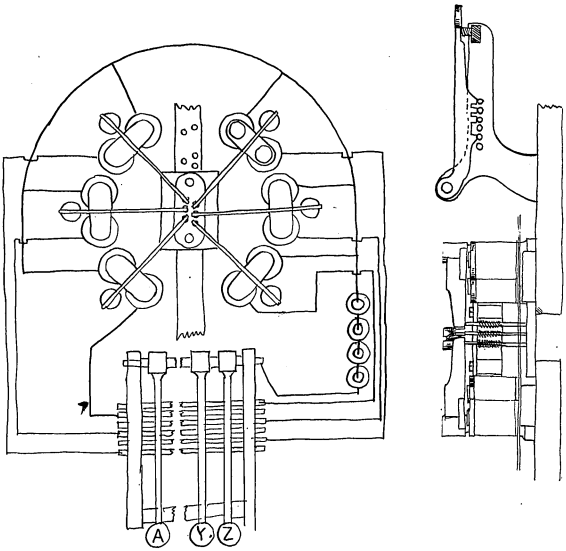
T A EDISON

Perforators for Automatic Telegraphs

44

141 775

Patented August 12 1873

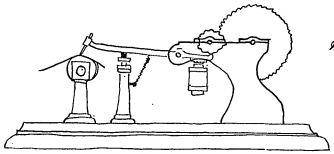


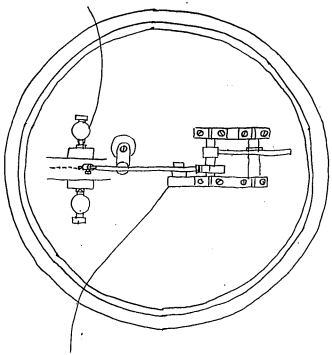
45

T A Edison

Rec Incts for Chemical Tel.

No 150,847 May 12 1874



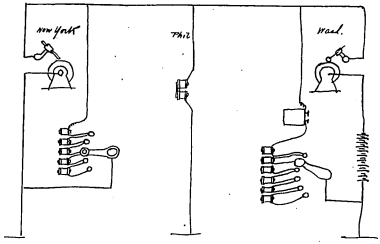


T A EDISON
Chemical Telegraphs

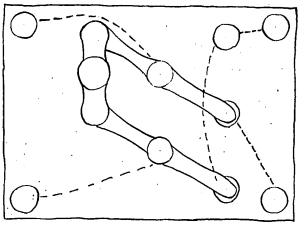
Sheet 1.

147 313

Feb 10 1874
Jan 29 1873 filed



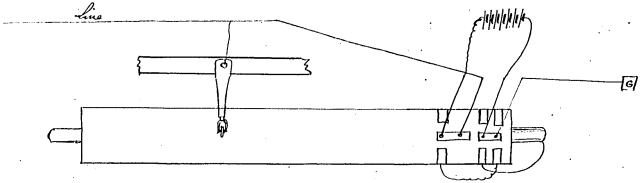
Current Reversers

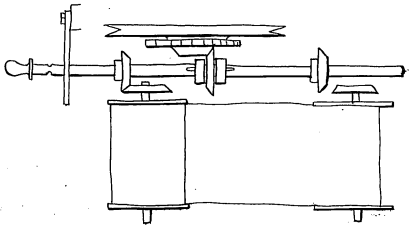


4/.

Reversing arrangement for
Morse character Private line printer

April 11th 1875





Rubber moving mechanism
of
Sholes & Glidden type writer

Electrum Solutions for Chemical Telegraphy

Pyrogallic Acid & Common Salt (Mr Che).
Very good for short circuit it does not come out instantaneously but gets darker with time. Pyrogallic Acid being acted upon by light it is necessary to put in enough salt in to counteract the as much as possible. The paper however will always be a little discolored. It is a brown mark on an almost white paper. I decided on this solution to run my Stock printer
April 3rd 1875 Chas Batchelor April 11th 1875

April 15th 1875 Batchelor's Printer

I find in working my printer that dots frequently chop out which is due to the induction of the relays in circuit in so short a circuit. I can obviate this by increasing the resistance of the line & battery power so as to get the same amount of induction, the bad effect of which is not felt so much on a long distance. If now we shunt the resistance with a condenser the fault entirely disappears
Owing to the

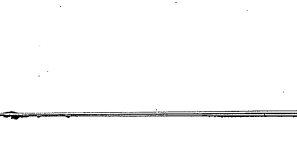


Fig 1

Description of Edison's Dot & dash
Private line printer. April 17th 1875

The object of this invention was to supply an cheap & reliable instrument for private lines, those having type wheels being exceedingly dear & complicated. It works without switches is always ready to receive & is always in open circuit. It records on chemically prepared paper. The Instrument consists of a clockwork A a transmitting roller B composed of brass washers with the 'Morse character' cut on the periphery. The contact spring H a keyboard C a reversing arrangement D a release E which is worked by a magnet under the base, a paper roll F enclosed in an iron box in order to keep the paper moist, a receiving stream G in which rest a stylus of platinum.

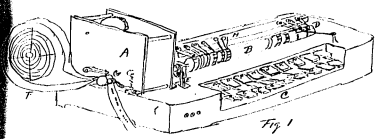
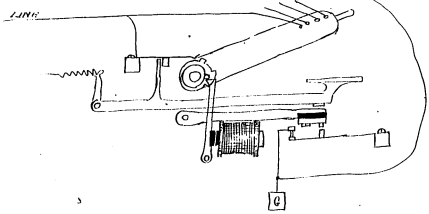


Fig 1

Fig 2 shows the principle of the connections



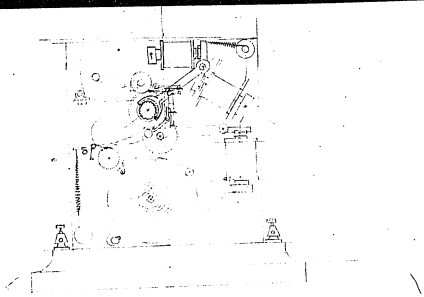
April 27th 1875 Platina Solution

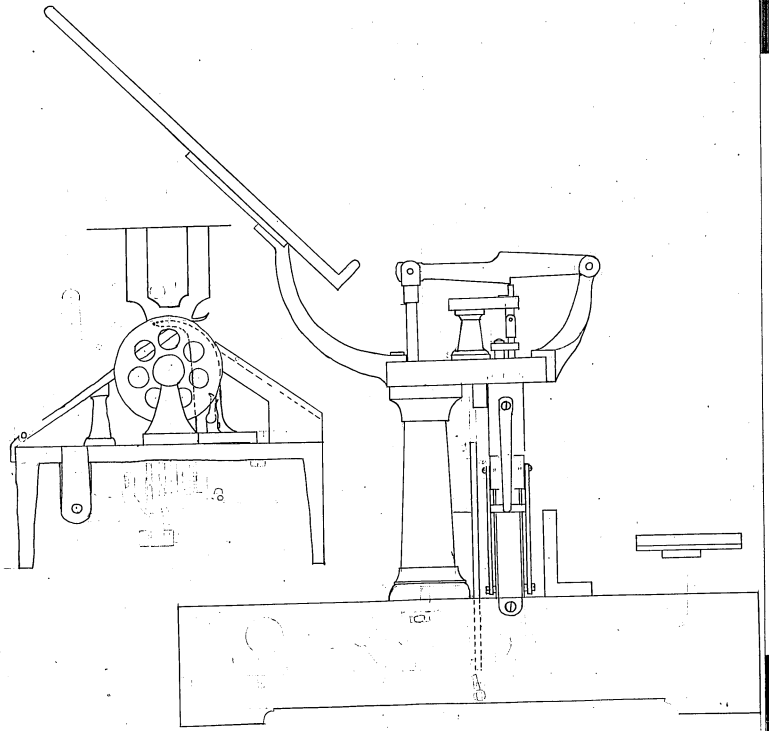
Water 1 Litre	
Pyrogallic acid 3 dwt	
Nitrate Strontia 1½ dwt	
Salt 6 oz.	
Platina pen on H	

Very good solution & permanent use it on my printer & it is OK.
Johnson tried it last night & Phil & Warden & got writing as fast as he could turn
C B

April 30th 1875
Origing Experiment
Aniline strike blue with Chromic acid tried to copy with it but with no success. Lacquered a platina plate 1/1000 in it with a strong sol. of Caus pot. which dissolved Shellac & washed off. Could then take a great many copies with Battery & sensitive paper but they are wrong side about.

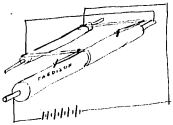
May 1st 1875
Roman letter receiver started running in Laboratory
New style Domestic box taken by Brown, spring & platina points instead of rollers. a good thing.





Sunday May 2 1875

Made machine with one pen left drawing. A long drum split in halves & insulated from each other. 2 Pens sliding together on an insulated rod 1 on each drum. Wrote with insulating ink on 1 drum & put sensitive paper on the other & moved the pens backwards & forwards quickly over them. The result was pretty



good. Fixed it & got some copies off. Pyro-gal sol. also Prussian Blue paper & the whitening of the current but the latter was not sensitive.

Got 100 Samples of static charge at 10 words per minute over the cable by shifting the condensers

Fixed (Alcohol + Nitro-) / Sulphuric Acid + Carb Soda for a new fire. Go go

---

May 3rd 1875

1 New Solution for Plat. pen

Pyrogallic Acid

Citric Acid in excess

Nitrate of Ammonia in excess

Yellow marks on O turns reddish

Started our new Synchronous 1 wire instruments & worked all night on them. They gave readable messages from the first & worked fair. Did not try them for perfect synchronism as they gave us good copies without adjustment. Fixed

graph would be all right for blotting but we cannot blot Pyro & they are useless until we can find some method of erasing

1878

the extra dots. Tellurium would do as it can be blotted out by hyposulphate of soda. but its difficulty & cost & work is quite a drawback!

May 5th

Worked all night on 1 Wire, found that SO_3 & Phosphoric acid will blot the pyro marks.

May 6th

Tartaric Acid added & Pyro sol makes it white &

May 6th

Got a mark from Alberene with dilute, fugitive, Potash instantly takes all colouring matter out & seems to solidify it.

Allowance that Ammonia good but fugitive

May 7th

Worked all night

Fixed up electrotypograph up as at first had to go at 5 AM (Baby sick) but Edison again got 300 words per minute

---

May 8th

Murray got Key of Domestic from Brown in there in charge pro tem!

Altered Letters on Domestic Box

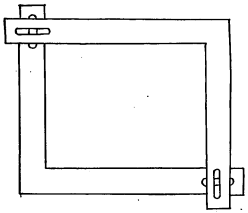
May 10 1875 Worked all night
Repeated through Electromotograph 80 words per minute perfect. Still find difficulty with it sometimes works & sometimes not
Made some blue & crimson fire.

May 13 1875 New York Mr Clark & Mr
" 16 " Agreement verbal between Edison & Murray Murray takes top room & half next floor & ½ cellar.
May 17 Moved machinery & 16th
May 26 Wednesday Domestic started & took about $3
27 Allen came at night & offered Edison 3 pages of matter if he would take Domestic part of Operator
I made Domestic Bills & June 1st $6 50 21
May 29 Murray first in office
Carpet down & one desk in office
At 26 Key printers set up

Aug 8th 1845

Frame for letter on new copying press must be made like this so that it will give a little after the paper gets wet needles just in frame & put paper on instead of gumming

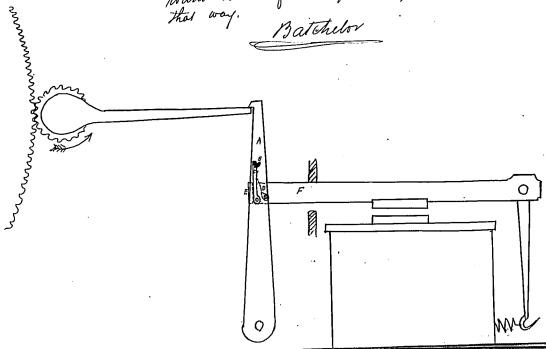
Batchelor



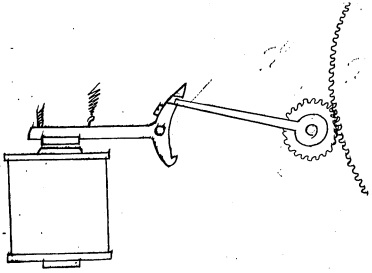
Aug 4th 1845

Release movement for Dom. Gong striker when armature closes pawl c pushes click a away by cam B affixed to a & lets d return before the magnet opens when the magnet opens pawl e goes round back of B as flexible spring D allows it to give that way.

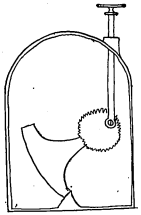
Batchelor



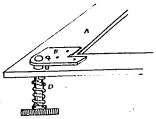
Aug 20th 1875
Stop & Cut off for Bell attachment
Chas Batchelor



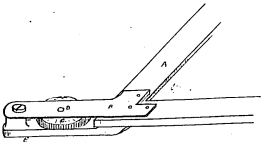
Sep 3rd 1875
New movement
for signalling on
Domestic Tel Co
RAN (Orig) pinched
July 31 Chas Batchelor



Sep 3 . 1875
New stop for paper on
new press.
Chas Batchelor



A paper frame
B stop with 3 prongs
C Guide pin
D Friction button with spring
Patn Aug 12 1875



Sep 3 1875
Paper stop adapted for new press for interlocking

A Point to wire
B Spring bolt pin in
C which will turn on link which acts on pin D compressing

Patn Aug 13.

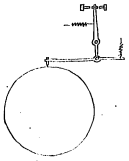
Chas Batchelor

Witnessed by [illegible]

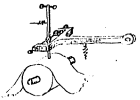
Sep 3 1875
New way of arranging
part & Both Tel Co Bx
A Segment
B Thin brass plate part
on with 2 stops
C Smooth pivoted lever with
spring
D Contact point
Chas Batchelor

Finished July 29

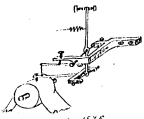
ELECTROMOTOGRAPH MOTIONS



Aug 12 1875
T A Edison

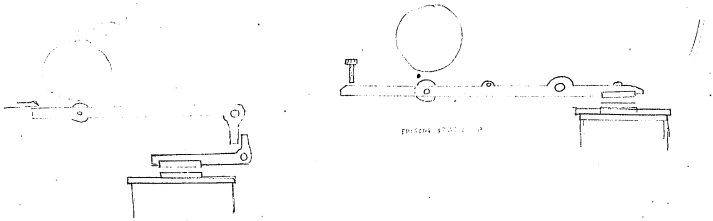


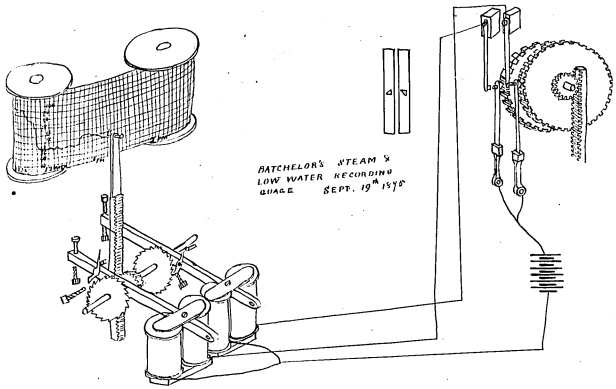
Aug 13 1875
Chalkstone



Aug 13 1875
T A EDISON

PRINTING LEVERS.

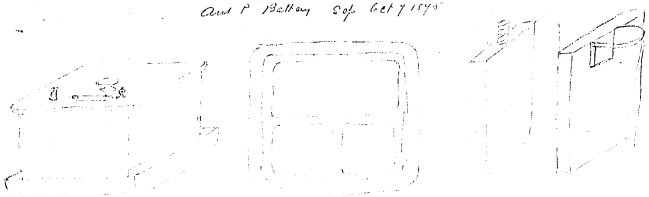


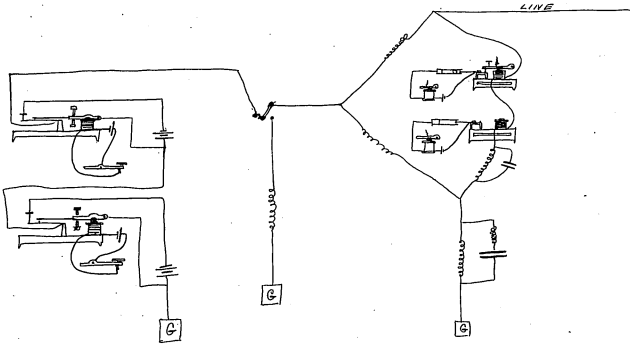


USES FOR THIS INSTRUMENT

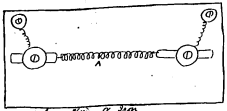
1 Recording Steam gauge
2 " hot & low water gauge in boiler
3 Rise & fall of the Piston (recording)
4 Rise & fall of supply reservoir (recording)

Aud P Bailey Sep. Oct 7 1845





Edison's Telephone Caveat Nov 13 1875

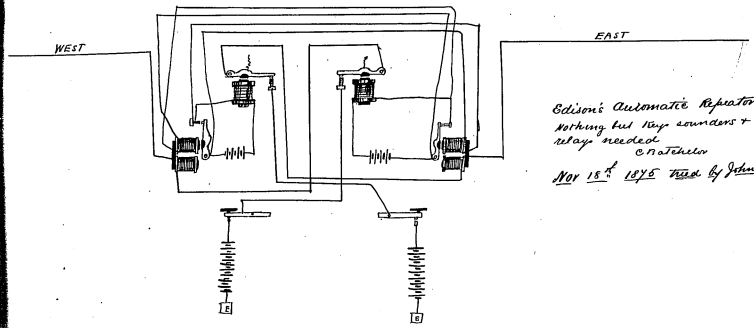


A German silver wire or iron

Acoustic telegraphy. Nov 15th 1875

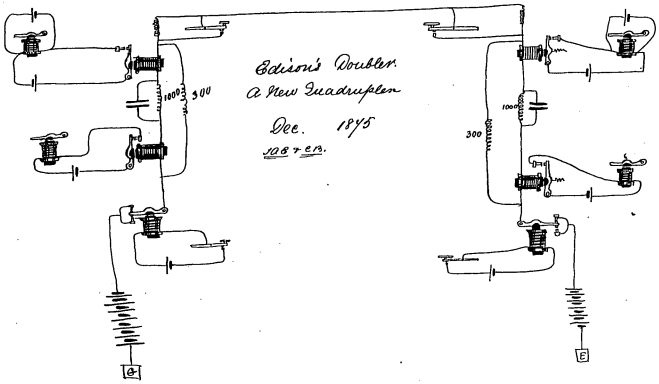
Edison's idea the jar of tuning forks would make German silver spring & shake apart & give greater resistance & work on the difference

Batchelor



Edison's Automatic Repeater
Nothing but Ray sounders +
relays needed
C N Fehler

Nov 15th 1875 Read by J Johnson



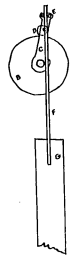
Edison's Doubler.
A New Quadruplex
Dec. 1875
Jos T. Eck.

Electrical Sewing Machine

October 16th 1846

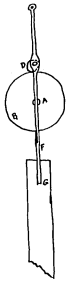
Driving apparatus.

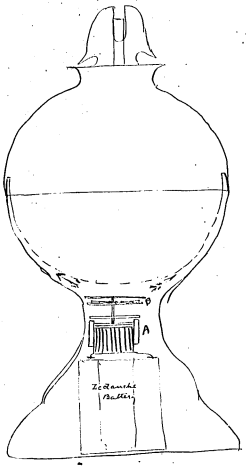
(1)



(1) A main shaft on which is large flywheel —
B smooth face wheel for which eccentric D binds driving it round
E. Driving pins for spring F which is fastened to Fork G. having large amplitude + about 85 vibrations

(2)



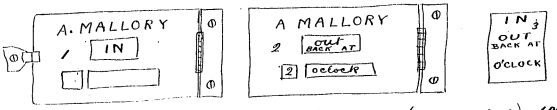


Lamp to burn Oxygen & without chimney. Oxygen to be supplied by electric engine & Leclanché battery in bottom of stand. Engine A drives fan B sending current of air round as indicated by arrows & acting directly on burner

Nov. 13th 1876

Charles Batchelor.

Office Door attachment

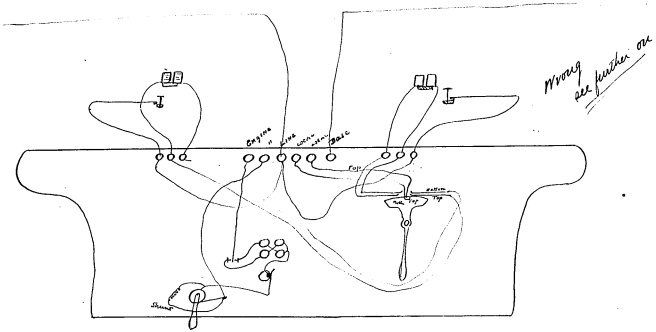


5

1 Is the plate shut against door shewing card IN & all others blank these cards Fig 3 slide between two lugs on the plate the figures being given by the same arrangement as a circular card as in fig 4 When the plate is shut & the door it engages with a clasp 5 Fig 2 shews it moved. These could be got up in good style and put on office doors for about 60 cts. each

Menlo Park Nov 15th 1876.

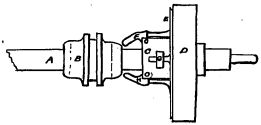
Chas Batchelor.



Connections for Edisons Embossing Translator
Now Making (pres Sin) at J. T. Murray's. Newark Apl 3rd 1877
Batchelor.

19

Friction Clutch, used on Pratt & Whitney Self feed Screw machine.
April 18th 1877.



A Shaft
B Shipper loose on shaft, no keyway.
C Large collar fast on shaft
D Pulley
E Cone on inside of Pulley
F & H Cam levers.
G Guide for Cone.

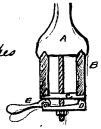
No.

Seen on Niall & Whitney Screw Machines

Rod Clamp for Screw Machines.

No 2

as used on Ponds hand lathes



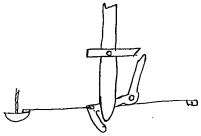
Hand Rest Clamp.

A Lathe head or hand rest
B Lathe bed
C Guide plate
D Clamp piece
E Cam for D

Embosser Telegraph

June 24th. 1844

Chas Batchelor

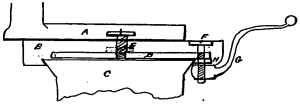


Movement for Embossing point and translating point occupying the same place on plate

No

Hand Rest Clamp.

As used on Washburn Hand Lathes.

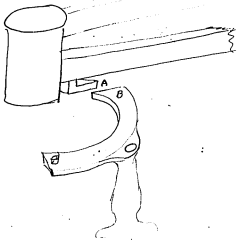


A Rest body
B Rest on carriage
C Lathe bed
D Clamp plate
E Screwed in D and slides in A
F Clamping screw, screwed in D and G
G Clamping handle
H Knurled washer

Edisons Embossing telegraph

Dat. March 21st 1877

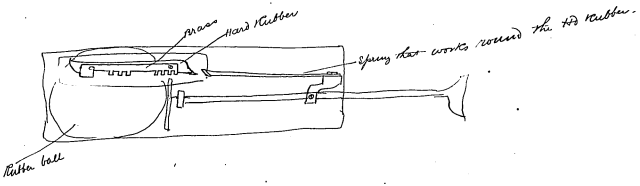
Chas Batchelor



When the arm has got to the end of spiral on plate the lug A on bottom swing arm strikes plate B and will not pass until lowered to right distance the arms cannot be put together again until it comes back on to spiral

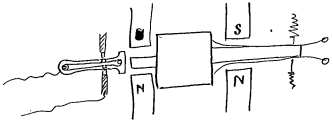
Annunciator (Hotel)

June 18th 1844
Chas Batchelor

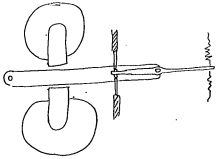


Brown & Allan's Relay
Telegraphic Journal
May 15 1877

June 18th 1877
Chas Batchelor



The arrangement is to procure the make or break instantly on the slightest rise or fall of the working current in Cables etc.

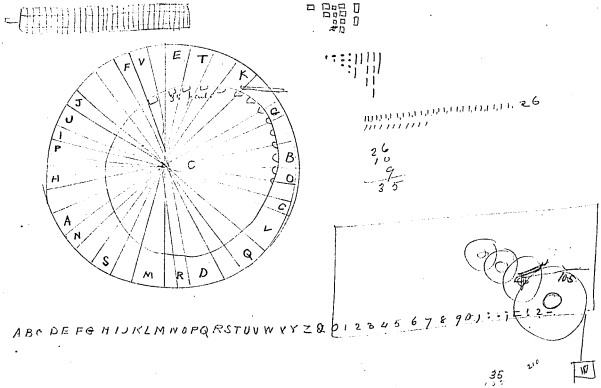


Edison's Embossing Translating telegraph
— Continuous roll for Press work.)

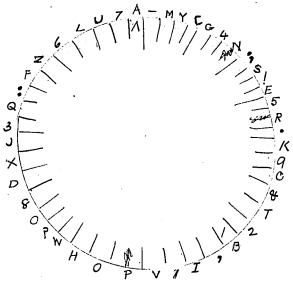
July 4th 1874
Chas Batchelor —

Cypher Machine

Nov. 24 1947
Chas Batchelor



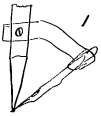
APM



Duplicating press

Method of making ordinary writing attachment for write as well as punctual

Nov 26th Edward Valentin.



What I want when I go to P.G.

To see about Kitten Boots

Sled. Dishes & Doll Head

~~[illegible]~~ Bedstead

Work Baskets

Something for Gussie & Annie.

Something for Katie Head & P Book

Something for Aunt Olivia

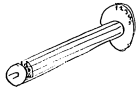
Something for the Christmas tree

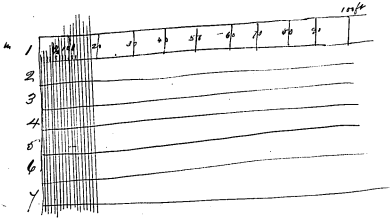
Darning Needle

Lumber Measuring machine

Dec 13th 1874

Chas Batchelor

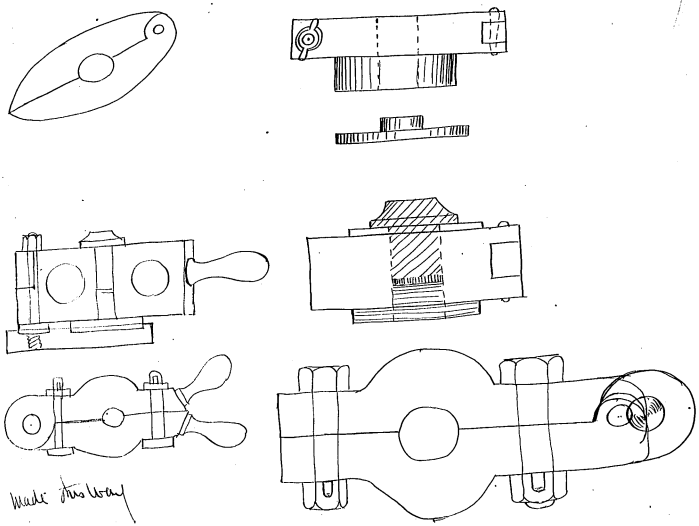




16
9,800
8,777

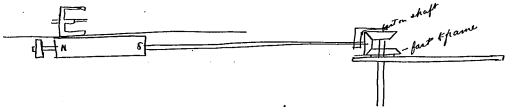
Mould for Plumbago plugs for Telephones

Jan 9th 1878.
Chas Batchelor



Made this way

Velocipede Toy Chas Batchelor Jan 21st 1878



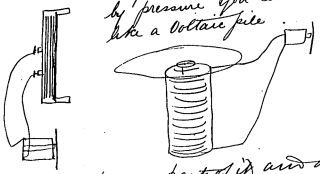
Magnet revolves around and wheel follows it.

Speaking Telephone

Chas Batchelor Feb 4 1878.

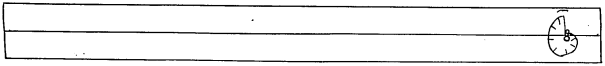
I conceive the idea that we can vary the resistance of the battery chief in making a telephone and this can be done with a high resistance one made of thin sheets of metal and a diaphragm to press it so as to give less resistance or it may be done with a very low resistance battery.

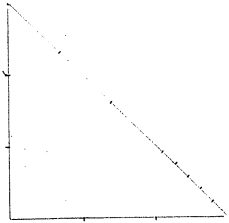
The preliminary experiments to try would be to find out whether by pressure you can alter the resistance of a battery made up like a Voltaic pile.



This may be received on a magnet or a condenser.

It may be that the diaphragm may by ~~made~~ gas or be the copper pole or part of it and as you talk it makes the pole larger in surface & consequently alters resistance

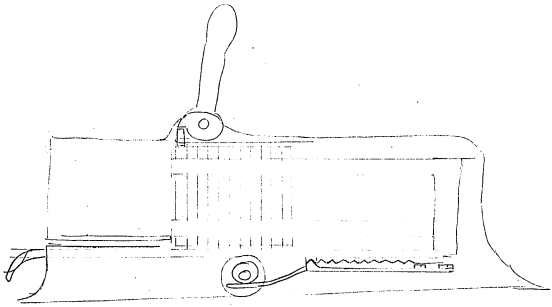


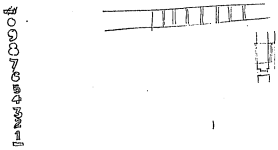


Nothing
Chart Protractor
Chart Protractor
Chart Protractor
Chart Protractor
Chart Protractor

Check punching Machine

Feb 16th 1898





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